In the Drawings:

Applicant proposes to amend the drawings as indicated in red on the attached sheets to add the word "Prior Art" to Figs. 1 through 4. With the Examiner's approval, please substitute the additional attached drawings that have the changes shown in red entered for the drawings originally filed.

REMARKS

With claims 1-35 originally pending, with this amendment claims 1-3, 5, and 10-24 have been cancelled. Further, claim 6-9, 25-27 and 33 have been amended and new claims 36-37 have been added as detailed below.

Objection to the Drawings

The drawings stand objected to because the Office Action states that Figs. 1-4 should be designated as 'Prior Art." Accordingly, with this amendment Applicants propose to amend the drawings to designate Figs. 1-4 as prior art. Applicants, therefore, respectfully request that the objection to the drawings be withdrawn.

Section 102 Rejection Based On Shimizu

Claims 1-5, 7, 15, 18, 19, 28 and 29 stand rejected under 35 U.S.C. §102(b) as being anticipated by Shimizu et al. (U.S. Patent No. 6,400,173, hereafter 'Shimizu'). Claims 1-3, 5, 15, 18 and 19 have been cancelled rendering this rejection moot with respect to those claims. Based on the following remarks, this rejection is believed to be overcome with respect to claims 7, 28 and 29.

Regarding claim 4, the Office Action states that Shimizu shows the claimed elements including a serial interface between a programmable controller and a test system controller. Claim 4 has been amended to include the limitations of claims 1 and 3 from which it depends, and to remove the "serial" interface. Shimizu is not believed to teach or disclose any of the remaining interfaces. Accordingly, claim 4 is now believed

allowable as not anticipated by Shimizu. Regarding claim 7, the Office Action with reference to Fig. 9a of Shimizu states that Shimizu discloses a programmable controller (5) configured to perform self testing of components included in the probe card assembly. Claim 7 has been amended to be an independent claim, and include the limitations of original claim 1. Claim 7 claims that the "the programmable controller is configured to perform self testing of components included in the probe card assembly." In contrast, the part of Shimizu referenced by the Office Action, Fig. 9(a) with element 5b, does reference a test IC 5b used to test chips CH. However, as indicated in col. 11, lines 25-50 of Shimizu, the test IC 5b and test chips CH are all included in a product wafer being tested. The test IC 5b has signals relayed by a probe card to test the chips CH all on the product wafer. The test IC 5b and chips CH are not included in a probe card, enabling test IC 5b to perform self testing of components of the probe card. Accordingly claim 7 is believed allowable as not anticipated by Shimizu under 35 U.S.C. §102(b).

Regarding claim 28, the Office Action, similar to claim 7, references Fig. 9a and additionally Fig. 1 and item (3) of Shimizu to support the claim language of claim 28 that "the programmable controller is configured to perform self testing of components included in the probe card assembly." As stated above with respect to claim 7, in col. 11, lines 25-50 of Shimizu, the test IC 5b and test chips CH of Fig. 9a are all included in a product wafer being tested. The test IC 5b and chips CH are not included in a probe card, enabling test IC 5b to perform self testing of components of the probe card. Further, controller (3) of Fig. 1 is not believed disclosed in the specification as providing for self testing or that the controller (3) is included in a probe card assembly, instead being a

separate device from the probe card (2). Accordingly, claim 28 is believed allowable as not anticipated by Shimizu under 35 U.S.C. §102(b).

Regarding claim 29, the Office Action cites Figs. 1 and 9a of Shimizu as disclosing a serial interface (4) configured to connect to a test system controller (3) to receive test signals for distributing to probes (6) of the probe card assembly (2). However, Shimizu discloses item (4) as an insulating substrate, not a serial interface. See col. 5, lines 61-67. There is no disclosure in Shimizu that the test system controller (3) transmits signals to the interface (4) in a serial manner to enable any serial to parallel conversion as claimed in claim 29. Accordingly, Applicants maintain that claim 29 is allowable as not anticipated by Shimizu under 35 U.S.C. §102(b).

Section 102 Rejection Based On Miller

Claim 17 stands rejected under 35 U.S.C. §102(e) as being anticipated by Miller (U.S. Patent No. 6,798,225). Claims 17 have been cancelled rendering this rejection moot.

Section 102 Rejection Based On Sporck

Claims 20-23 stand rejected under 35 U.S.C. §102(e) as being anticipated by Sporck et al. (U.S. Patent No. 6,856,150). Claims 20-23 have been cancelled rendering this rejection moot.

Section 102 Rejections Based On Leas

Claims 24 and 25 stand rejected under 35 U.S.C. §102(b) as being anticipated by Leas et al. (U.S. Patent No. 6,351,134, hereafter 'Leas'). Claim 24 has been cancelled rendering this rejection moot with respect to claim 24. Claim 25 has been amended to be dependent on claim 27 and is believed allowable as not anticipated by Leas based at least on its dependency on claim 27.

Section 102 Rejections Based On Nelson

Claim 27 stands rejected under 35 U.S.C. §102(b) as being anticipated by Nelson et al. (U.S. Patent No. 5,550,480, hereafter 'Nelson'). The Office Action states that Nelson discloses a DC-DC converter (Vref3, col. 7, lines 11-16) distributing power to multiple test probes 25, 20. Claim 27, as amended, however, now in addition to the DC-DC converter for distributing a single power supply line to multiple branches, claims power supply isolation devices connected in each branch. This arrangement is shown by DC-DC converter 134 and voltage regulators 130_{1-4} of Applicants' Fig. 6. The isolation devices enable the DC-DC converter to increase current to drive more DUTs as described in Applicants' paragraph 36. Nelson does not disclose a DC-DC converter in combination with power supply isolation devices connected in each branch. Accordingly, Applicants maintain that claim 27 is allowable as not anticipated by Nelson under 35 U.S.C. §102(b).

Section 102 Rejection Based On Lino

Claims 33-34 stand rejected under 35 U.S.C. §102(b) as being anticipated by Lino et al. (U.S. Patent No. 6,380,753, hereafter 'Lino'). Based on the following remarks, this rejection is believed to be overcome.

Regarding claim 33, the Office Action states that Lino in Fig. 2 shows a probe card assembly with a serial digital to analog converter (25) serially receiving a digital test signal and distributing the signal in analog form to the test probes. In contrast with the Office Action assertion, however, the D/A converter (25) output is provided to a current monitoring device 23 and not to test probes. All signals from the current monitor device 23 are provided back toward control station 12. None of the signals from D/A converter 25 are indicated as being provided to test probes of the wafer. Further, the data signal provided from controller 21 to the D/A converter 25 appears to be a parallel signal. Accordingly, Applicants maintain that claim 33 is allowable as not anticipated by Nelson under 35 U.S.C. §102(b).

Claim 34 is believed allowable as not anticipated by Nelson based at least on its dependency on claim 33.

Section 103 Rejection Based On Shimizu in view of Lino

Claims 6, 8, 9, 30 and 31 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Shimizu in view of Lino. Based on the following remarks, this rejection is believed to be overcome.

Regarding claims 6, 8, 30 and 31, the Office Action states that Shimizu discloses the claimed elements except for the programmable controller comprising a serial to

parallel converter configured to receive the test signals and to convert the signals from serial to parallel and distribute the test signals to the test probes. The Office Action, however, continues to state that Lino in Fig. 2 shows a programmable controller (13) comprising a serial to parallel converter (31) configured to receive test signals (from 12) and to convert the test signals from serial to parallel and distribute the test signals in parallel to the test probes. The Office Action then states that it would have been obvious to combine the teachings of Lino with Shimizu to form claims 6, 8, 30 and 31 for the purposes of fanning out the test signal.

In Lino, however, the multiplexer 31 is shown in Fig. 2 as part of an application measurement module 13 provided separate from the probe card 17 containing test probes. Thus, in contrast with claims 6, 8, 30 and 31, the multiplexer 31 is not provided as part of a probe card assembly as claimed. As indicated in Applicants' paragraph 44, the serial bus interface minimizes the amount of interface wires needed to connect test signals to a probe card. Any fan-out achieved by combining Shimizu and Lino, as indicated by the Office Action to be the reason to combine references, actually increases the number of interface wires needed to connect to a probe card assembly in contrast with the structure of the present invention. Accordingly, claims 6, 8, 30 and 31 are believed allowable as non-obvious over Shimizu over Lino under 35 U.S.C. § 103.

Regarding claim 9, the Office Action states that Shimizu discloses the claimed elements except for the serial digital to analog converter configured to convert and provide the test signals to the test probes in analog form. The Office Action, however, continues to state that Lino in Fig. 2 shows a serial digital to analog to converter (25) serially receiving a digital test signal and distributing the signal in analog form to the test

probes. The Office Action then states that it would have been obvious to combine the teachings of Lino with Shimizu to form claim 9 for the purpose of converting a signal from one form to another.

In Lino, however, the D/A converter (25) output is provided to a current monitoring device 23. The current monitoring device 23, then receives signals from multiplexer 22 and all signals from the current monitor device 23 are provided back toward control station 12. None of the signals from D/A converter 25 are indicated as being provided to test probes of the wafer. Further, the data signal provided from controller 21 to the D/A converter 25 appears to be a parallel signal. Accordingly, Applicants maintain that claim 9 is allowable as non-obvious over Shimizu over Lino under 35 U.S.C. §103.

Section 103 Rejection Based On Shimizu in view of Sporck

Claims 10, 11, 13 and 14 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Shimizu in view of Sporck. Claims 10, 11, 13 and 14 have been cancelled rendering this rejection moot.

Section 103 Rejection Based On Shimizu, Sporck and Nelson

Claim 12 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Shimizu in view of Sporck and further in view of Nelson. Claim 12 has been cancelled rendering this rejection moot.

Section 103 Rejection Based On Shimizu in view of Miller

Claim 16 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Shimizu in view of Miller. Claim 16 has been cancelled rendering this rejection moot.

Section 103 Rejection Based On Leas in view of Sporck

Claim 26 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Leas in view of Sporck. Claim 26 has been amended to be dependent on amended claim 27. Claim 26 is believed allowable as non-obvious over Leas in view of Sporck based at least on its dependency on claim 27.

Section 103 Rejection Based On Shimizu in view of Lino

Claims 32 and 35 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Shimizu in view of Lino. Claim 32 is believed allowable as non-obvious over Shimizu in view of Lino based at least on its dependency on claim 29. Claim 35 is believed allowable as non-obvious over Shimizu in view of Lino based at least on its dependency on claim 33.

New Claims

New claims 36 and 37 are not believed to be taught or shown in any of the cited references. Accordingly claims 36 and 37 are both believed in condition for allowance.

Conclusion

In light of the above amendments and remarks, claims 4, 6-9 and 26-37 are now all believed to be in condition for allowance. Accordingly, reconsideration and allowance of these claims is respectfully requested.

Respectfully submitted,

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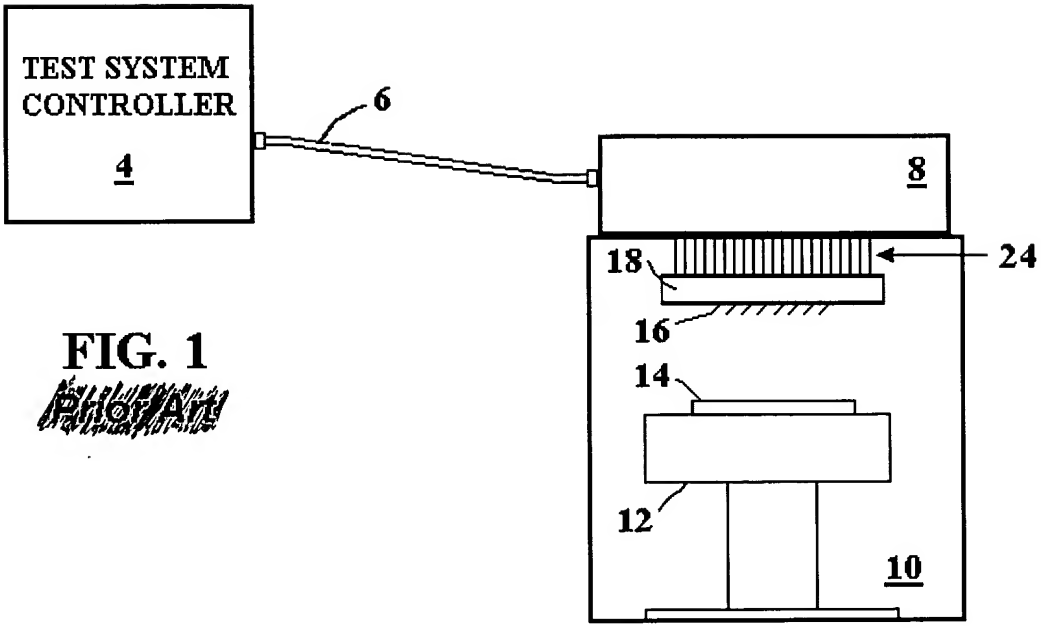

FIG. 1
Prior Art

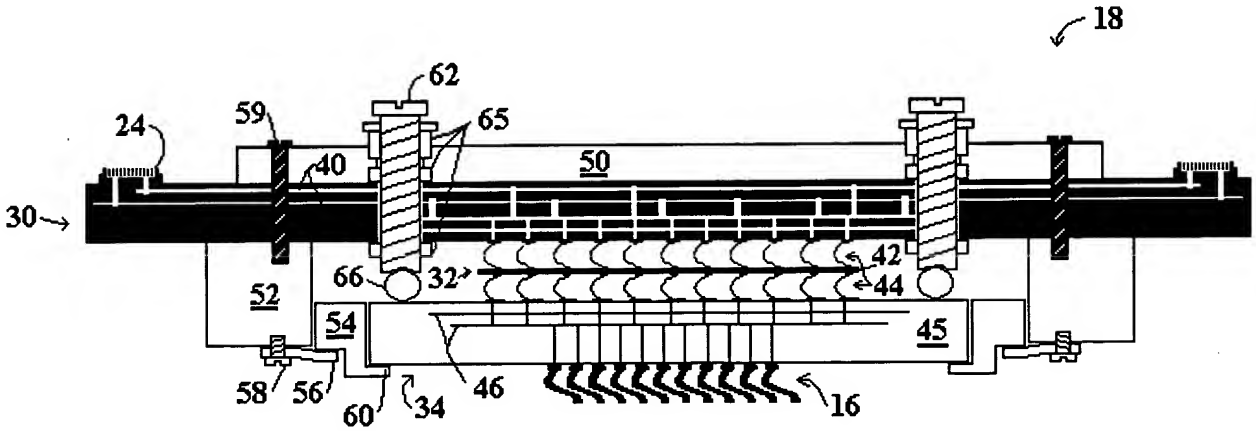

FIG. 2
Prior Art

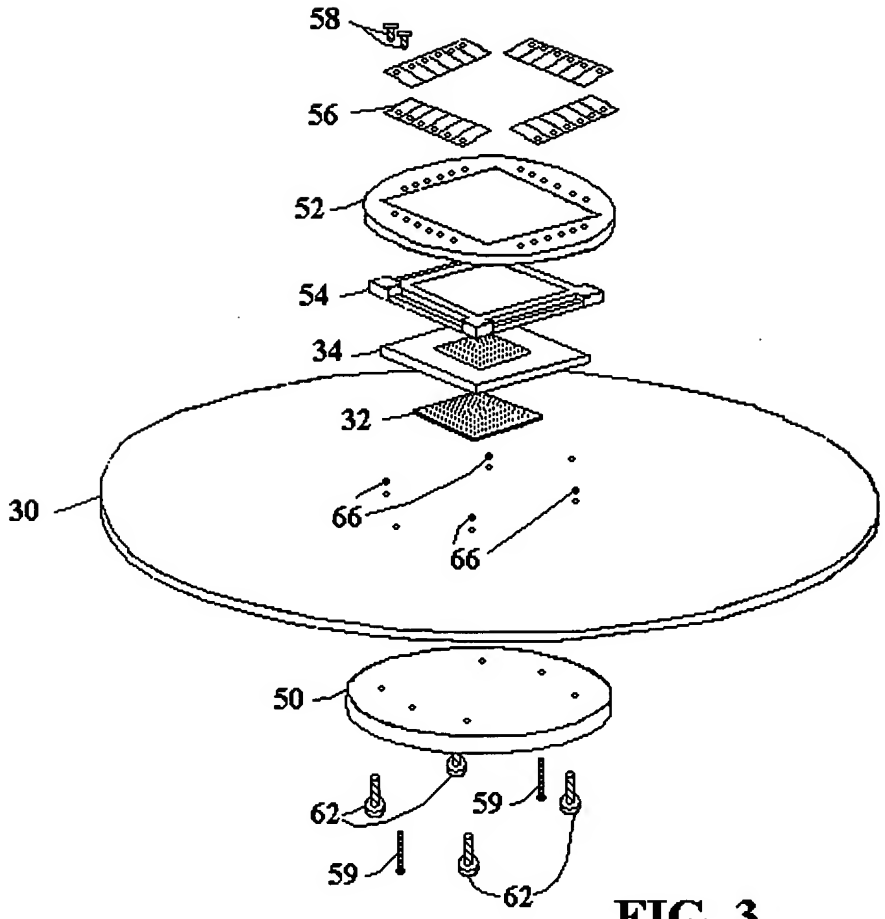

FIG. 3
Prior Art

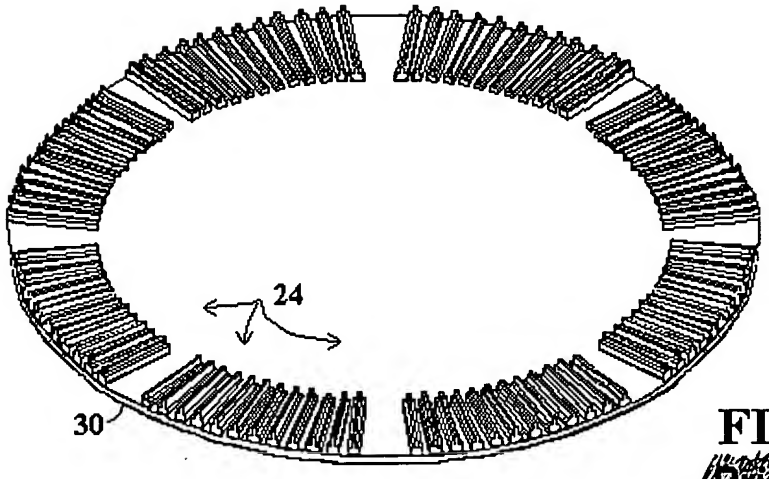

FIG. 4
Prior Art